

REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-36 are currently pending. Claims 1-36 have been amended by the present amendment. No new matter has been added.

In the outstanding Office Action, Claims 2-10 and 12-36 were objected to as containing various informalities. Applicant has amended these claims as suggested by the Examiner in order to overcome the objections. Claim 11 has also been amended to correct an informality noted by Applicant. Accordingly, the objections to the claims are believed to have been overcome.

Claims 1-36 were rejected under 35 U.S.C. 102(e) as being anticipated by Gai et al. (U.S. Patent No. 6,678,241, hereinafter "Gai"). Applicant has amended independent Claims 1, 18, and 35 in order to clarify the distinction of the claims over Gai. In addition, Applicant respectfully traverses the rejections of Claims 11-17, 28-34, and 36.

Amended Claim 1 recites a method for eliminating loops in a communication network, in which nodes are configured to operate as virtual bridges, linked by virtual connections between virtual ports. Each of the virtual connections coincides respectively with one or more network segments. Claim 1 has been amended to recite that at least one of the virtual connections coincides with two or more network segments, which are linked in series via at least one intermediate node. In a non-limiting example, this situation is illustrated in Figs. 1, 2A, and 2B of the present patent application, in which virtual connection (LSP) 26 coincides with the network segments between nodes 12 and 14 and nodes 14 and 16, which are linked in series via node 14. (For further description, see paragraph 0061 in US 2003/0026209, which is the published version of this application.)

In a non-limiting example, each virtual port is assigned a respective port cost, responsive to the count of network segments with which the respective virtual connection coincides. The port costs are assigned so as to favor virtual paths that are made up of a greater number of virtual connections. Turning again to the non-limiting example shown in Fig. 1, this cost assignment scheme would favor the virtual path between nodes 12 and 16 that is made up of the two virtual connections 22 and 24, over the alternative virtual path between these nodes over the single virtual connection 26. The port costs are used in computing path costs, which are then used in selecting the virtual connections over which to send traffic between the virtual bridges.

Regarding the rejection of Claim 1, the Gai patent describes a system for fast topology switching in response to network failures. Gai uses “logical” VLANs, each having a set of “physical” VLANs with different loop-free topologies. Upon detecting a failure in the current physical VLAN, the logical VLAN is rapidly switched to a second, back-up physical VLAN. See abstract. Each of the links in Gai’s VLANs corresponds to a single physical link 248 between switches in the network. See Fig. 2 and col. 10, lines 36-48. Gai neither teaches nor suggests that a virtual connection in his network might coincide with two or more network segments, as required by amended Claim 1.

Furthermore, Gai does not describe any specific method for assigning port costs. Gai simply states (page 11, lines 1-16) that the network administrator may adjust the costs manually for each physical VLAN in order to block certain links. Gai makes reference to a mechanism for port cost adjustment in U.S. Patent Application 08/998,412 (now U.S. Patent No. 6,032,194). There is no suggestion, however, either in Gai or in the cited patent of assigning port costs so as to favor virtual paths that are made up of a greater number of virtual connections, as recited in Claim 1. In fact, cost assignment schemes known in the art

tend to favor shorter paths, i.e., paths made up of smaller numbers of connections, and Gai gives no hint that it might be desirable to depart from this norm.

MPEP § 2131 states:

TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)... "The identical invention must be shown in as complete detail as is contained in the... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

As demonstrated above, Gai clearly does not teach every element of amended Claim 1.

Therefore, claim 1 is believed to be patentable over the cited art.

In view of the patentability of Claim 1, dependent Claims 2-10 are also believed to be patentable. Furthermore, notwithstanding the patentability of claim 1, the dependent claims recite independently-patentable subject matter. In the interest of brevity, Applicant will not argue the patentability of all of the dependent claims, but a few representative examples will be cited below.

Claim 2, which depends from Claim 1, adds the limitation that the nodes and segments are configured in a ring topology. Claim 3 depends from Claim 2 and adds that the virtual connections over which the traffic is sent define simple paths conforming to the ring topology. Gai neither teaches nor suggests the use of ring topologies. In rejecting Claim 2, the Examiner made reference to col. 5, lines 16-51, in Gai. This passage refers to definition of loop-free topologies. A ring, in fact, has the form of a loop. Thus, far from teaching the limitations of Claims 2 and 3, the cited passage teaches away from these limitations. Claims 2 and 3 are therefore believed to be independently patentable over the cited art.

As another example, Claim 5 depends from Claim 4, which depends from Claim 1, and adds the limitation that when a virtual connection between a first virtual bridge and a second virtual bridge overlaps a sequence of two or more other virtual connections between the first virtual bridge, one or more intermediate virtual bridges, and the second virtual bridge, the first virtual connection is blocked. This claim corresponds to the situation shown, for instance, in Fig. 2B of the present patent application and described in paragraph 0064. Gai neither teaches nor suggests the possibility of overlap between one virtual connection and a sequence of two or more other virtual connections. Such overlap would not occur in Gai's network, in which each VLAN is made up of single links 248 between nodes. The passage cited by the Examiner against this claim (col. 15, lines 25-50) makes no reference to overlap or to resolution of such overlap. Therefore, Claim 5 is believed to be independently patentable over the cited art.

As a final example, Claim 9 depends from Claim 1 and adds the limitation that each of the port costs is set equal to a first constant time the count of the network segments with which the respective virtual connections coincide, less a second constant. As noted above, Gai does not teach or suggest any formula for computation of port costs, and thus cannot be taken to anticipate the specific method for setting port costs that is recited in Claim 9. There is not the slightest hint in either Gai or in U.S. Patent 6,032,194 (cited by Gai in col. 11, lines 8-13) of a port cost formula using constants and network segment counts as required by Claim 9. Therefore, Claim 9 is also believed to be independently patentable over the cited art.

Claims 18-27 recite a device for operation as one of a plurality of nodes in a communication network, which operate on principles analogous to the methods of Claims 1-10. Claim 35 recites a communication network, which likewise operates on principles analogous to the method of Claim 1. Independent Claims 18 and 35 have been amended in a

manner analogous to the amendment to claim 1. Thus, Claims 18-27 and 35 are believed to be patentable over the cited art for the reasons explained above.

Independent Claim 11 recites a method for eliminating overlap in a communication network, in which nodes are configured to operate as virtual bridges, linked by virtual connections between virtual ports. Each of the virtual connections coincides respectively with one or more network segments. The virtual connections over which to send traffic between the virtual bridges are selected such that when a first virtual connection between a first virtual bridge and a second virtual bridge overlaps a sequence of two or more other virtual connections, the first virtual connection is blocked, and the traffic is sent over the sequence of virtual connections. The blocking of the first virtual connection in this case is exemplified by the blocking of LSP 26 in favor of LSPs 22 and 24, which it overlaps, as shown in Fig. 2B of the present patent application and explained in paragraph 0064.

As explained above in reference to Claim 5, there are no overlapping virtual connections in Gai's networks, and Gai can thus provide no teaching or suggestion of resolving such overlap in the manner recited in Claim 11. In rejecting Claim 11, the Examiner referred to col. 11, lines 1-31, and col. 15, lines 25-20, in Gai. The passage in col. 11 relates to assigning port costs so as block different links 248 in different "physical VLANs." The passage in col. 15 refers to Gai's topology switching mechanism. There is no disclosure of overlapping virtual connections in either of these passages.

Therefore, Claim 11 is believed to be patentable over the Gai patent. In view of the patentability of independent Claim 11, dependent Claims 12-17 are also believed to be patentable. Applicant will refrain from arguing the independent patentability of the dependent claims for the sake of brevity.

Claims 28-34 recite a device for operation as one of a plurality of nodes in a communication network, which operate on principles analogous to the methods of Claims 11-

17. Claim 36 recites a communication network, which likewise operates on principles analogous to the method of Claim 11. Thus, Claims 28-34 and 36 are believed to be patentable over the cited art for the reasons explained above.

Applicant believes the amendments and remarks presented hereinabove to be fully responsive to all of the objections and grounds of rejection raised by the Examiner. In view of these amendments and remarks, Applicant respectfully submits that all of the claims in the present application are in order for allowance. Notice to this effect is hereby requested.

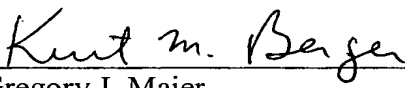
Respectfully submitted,

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